

Indiana Utility Regulatory Commission (IURC) Midwest ISO 2008 Summer Reliability & Market Update



June 4, 2008

Agenda

- Summer 2007 Review
- Summer 2008 Readiness
 - Summer Readiness Workshop
 - 2008 Summer Assessment
 - New Products
- Items of Interest
 - Ancillary Services Market Update
 - Wind Integration
 - Resource Adequacy
- Value Proposition
 - Contingency Reserve Sharing Group

Summer 2007 Review - Indiana

- Four (4) utilities in Indiana¹ set all-time peak demand records
- Indiana peak load totaled ~17,000 MW
- At that time, Indiana was importing ~2,500 MW (15%)
 - The Midwest ISO was also capable of moving reliably over 4,000 additional MW to Indiana to serve load if needed
- During the peak week (August 4th -10th), Duke's Wabash River Station² was forced off-line due to high river temperatures



¹ Calculations shown represent all Indiana entities within the Midwest ISO

² Capacity = 668 MW (Source: <http://www.duke-energy.com/power-plants/coal-fired/wabash.asp>)

Summer 2008 Readiness

- Conducted Summer Readiness Workshop on May 1, 2008
- Presented 2008 Summer Assessment
- Reviewed new products (LMR¹ and EDR²)
- Reviewed enhancements to Maximum Generation Emergency Procedures
- Provided an update on Balancing Authority (BA) certification and Ancillary Services Market (ASM)



¹ Load Modifying Resource

² Emergency Demand Response

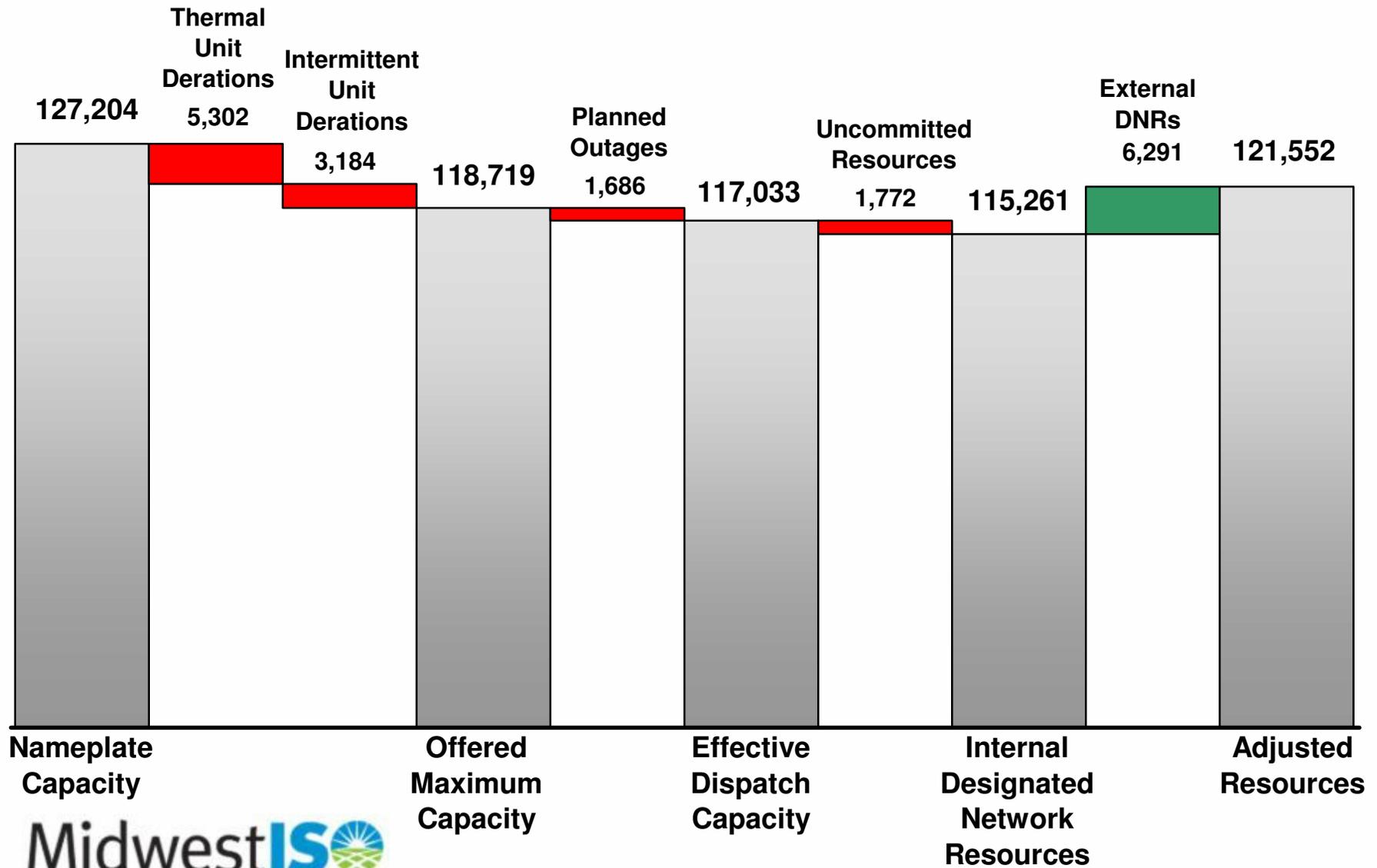
Summer 2008 Assessment

- The Midwest ISO Market Footprint has a NERC construct reserve margin of 21.5% which exceeds the established minimum of 14.5%
- Margins are calculated with full utilization of demand side management

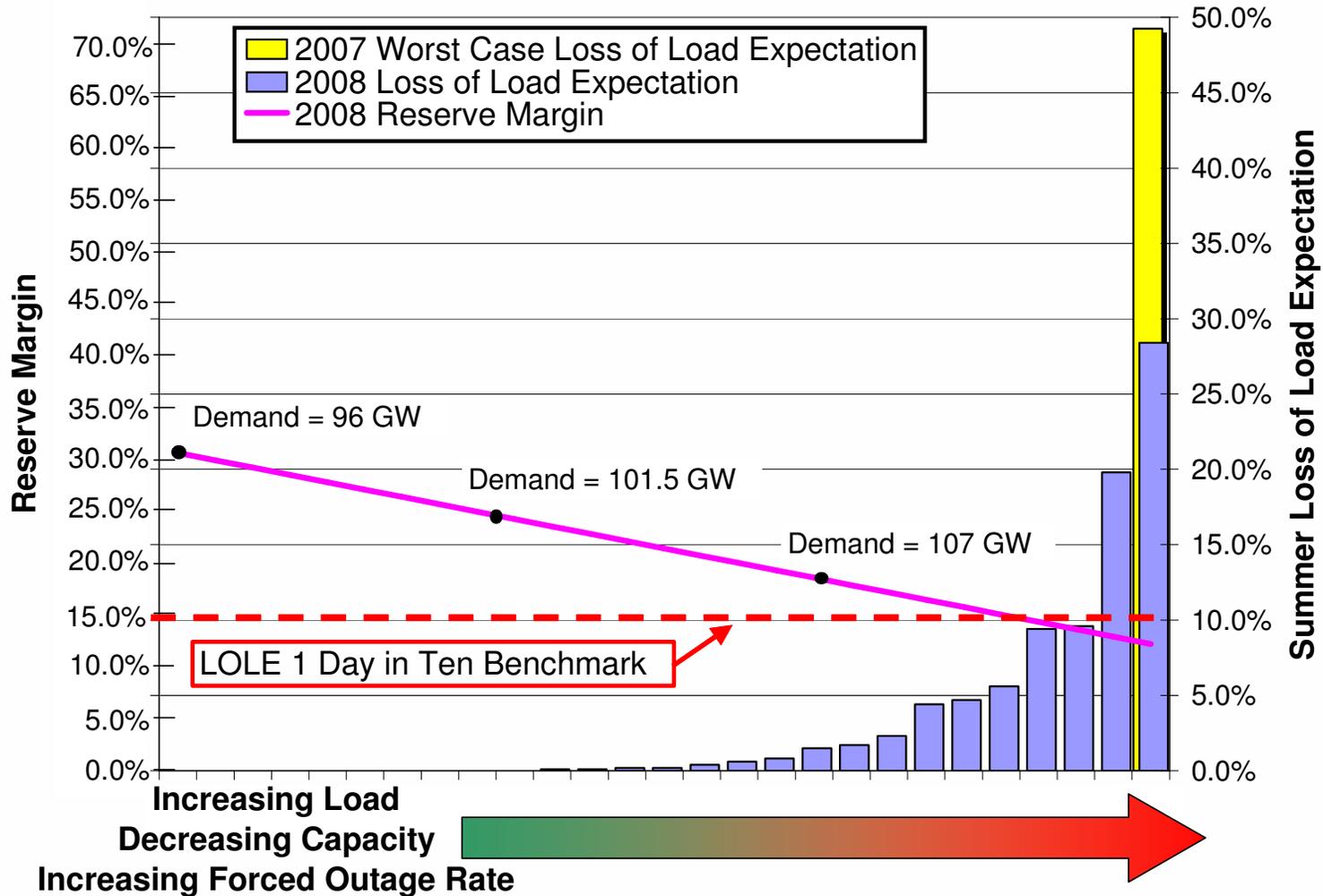
- Factors influencing Reserve Margin change:
 - Diversity factor
 - Decrease in load forecasts
 - Increase in reported demand side resources
 - Former ECAR members now have planning reserve margin

Demand (MW)	2008	2007
Non-Coincident	112,709	113,198
Estimated Diversity	4,454	2,647
Gross Coincident	108,255	110,551
Direct Control Load Management	1,738	1,565
Interruptible Load	3,066	2,534
Behind-the-Meter Generation	3,442	3,215
Net Internal Demand	100,009	103,237
NERC Construct Reserve Margin	2,008	2,007
Reserve Margin (MW)	21,543	13,881
Reserve Margin (%)	21.5%	13.4%

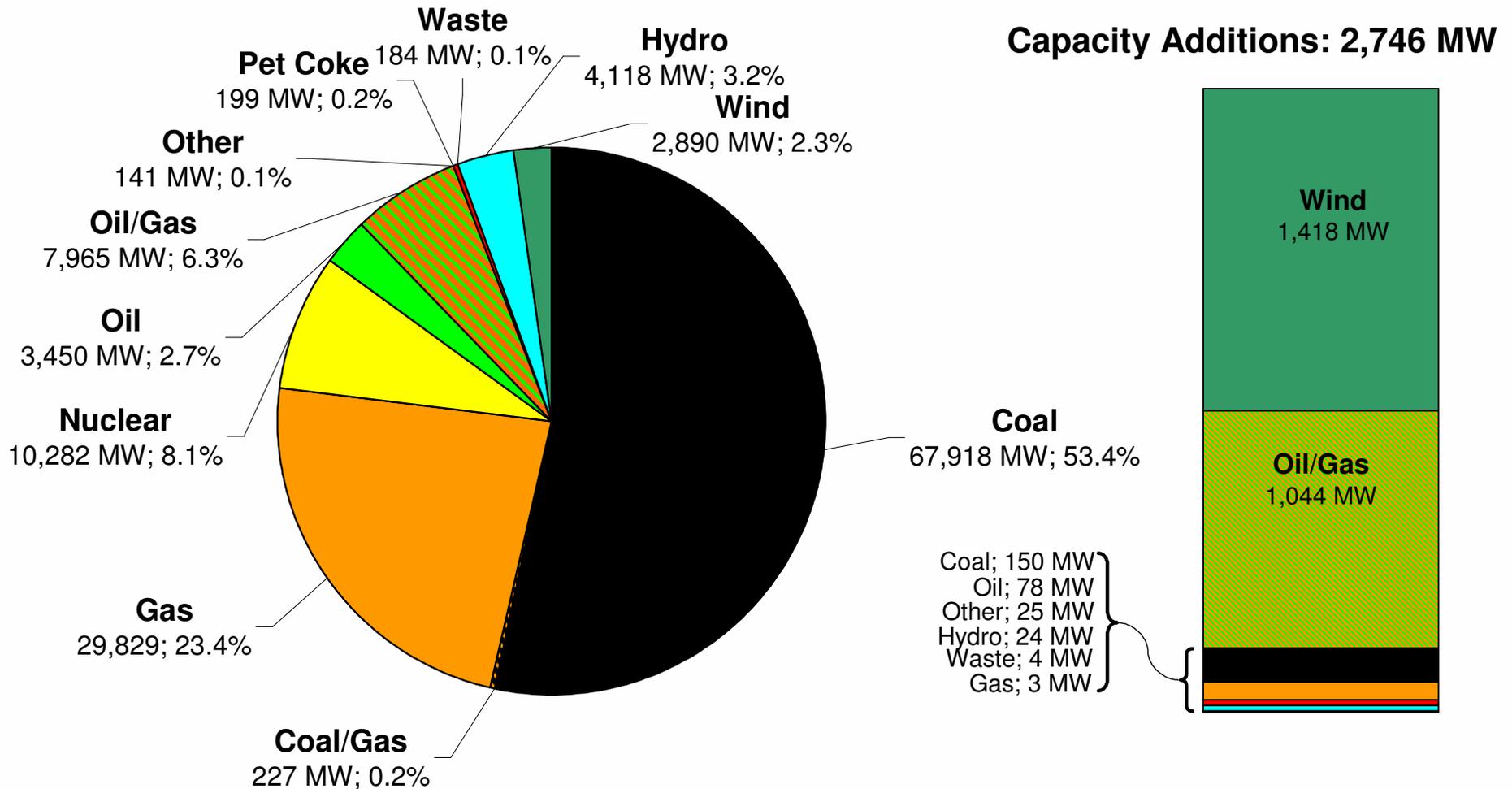
Summer 2008 - Capacity Overview



Summer 2008 - Risk Assessment



Summer 2008 - Nameplate Capacity by Fuel



Total Nameplate Capacity: 127,204 MW

New Products

Emergency Demand Response (EDR)

- While we have received national awards of excellence, we have continued to refine our tools and systems to add even more value and reliability for the summer 2008 – EDR is an example of further refinement
- Midwest ISO filed EDR initiative on December 31, 2007 and received conditional FERC approval on April 22, 2008, effective May 1, 2008
- Provides categories of demand response in an Energy Emergency Level 2 (EEA2) situation
 - To establish curtailment priorities
 - To reflect varying costs
 - To allow the Midwest ISO to create merit order offer stacks by locations and priority status
- Provides compensation of demand response in an EEA2 situation
 - As compared to Day-Ahead schedules
 - The higher of Real-Time Locational Marginal Price (LMP) or emergency demand response offers (offers are initially part of registration process)

Ancillary Services Market Update

- Key accomplishments:
 - FERC Order accepting tariff on February 25th
 - 30-day and 60-day Compliance Filing submitted
 - Balancing Authority Agreement amendments approved on March 14th
 - Balancing Authority Certification received from the three regional entities and NERC on April 16th
 - Successful completion of system operational tests
- Future activities:
 - Additional classroom style training for customers
 - Additional Parallel Operations tests, including three 24-hour continuous five day tests during the next 3 months

Summer 2008 - Wind Integration

- Wind is composing a larger portion of the footprint
 - 96% increase in nameplate capacity from 2007
 - Indiana has 130 MW of wind generation online, with ~3,150 MW in the Midwest ISO interconnection queue through December 2009
- Intermittent nature provides no guarantee of wind capacity availability on peak

	2005		2006		2007		2008	
	MW	% of NP	MW	% of NP	MW	% of NP	MW	% of NP
Nameplate Capacity (NP)	871		1,032		1,462		2,890	
Nameplate less Intermittent Deration ⁴	174	20.0%	217	21.0%	307	21.0%	604	20.9%
Designated Network Resources ⁴	92	10.6%	148	14.3%	147	10.1%	224	7.8%
Actual Metered at Peak	103 ¹	11.8% ¹	686 ²	66.5% ²	24 ³	1.6% ³		

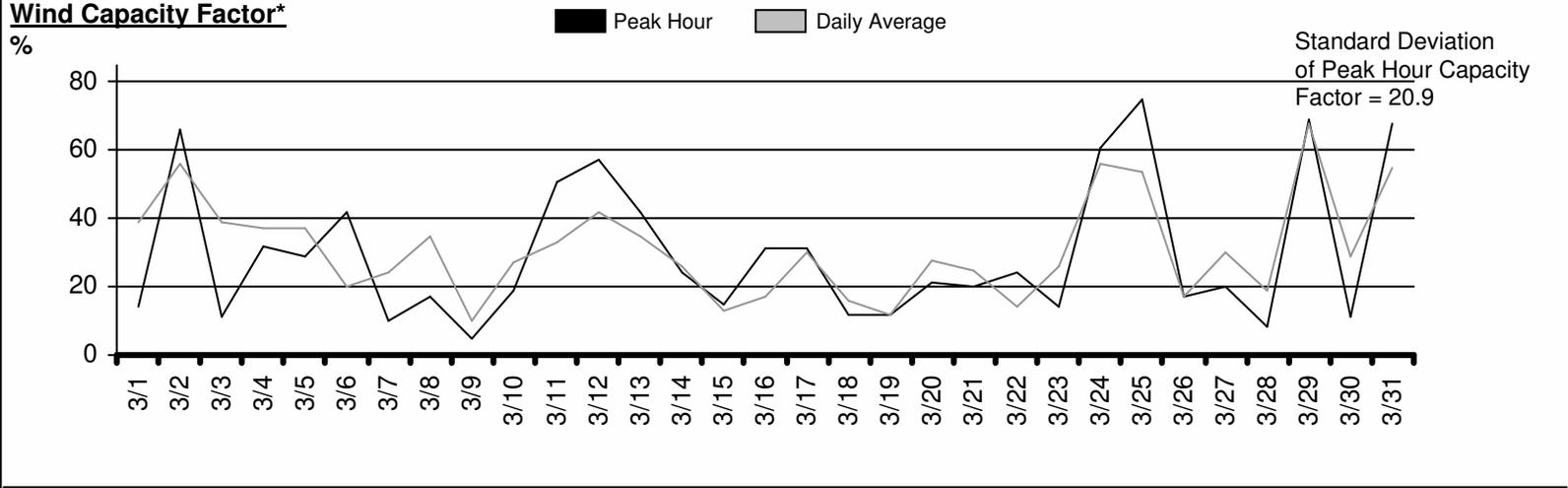
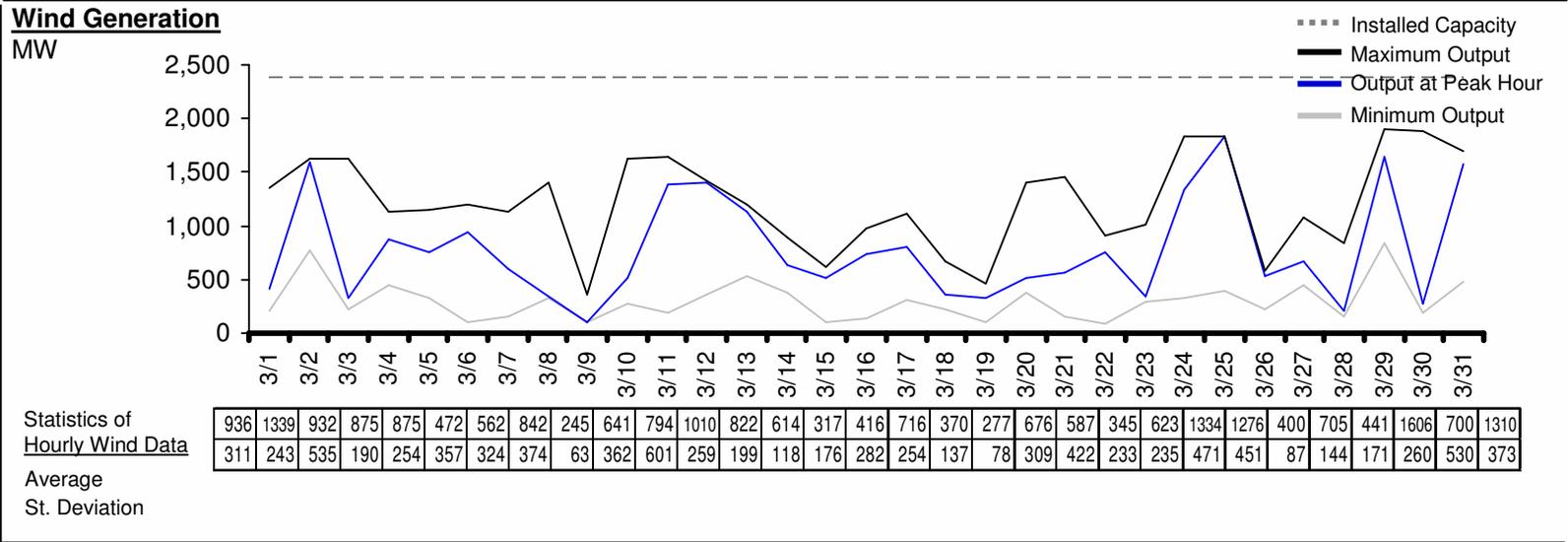
¹ Midwest ISO Peak Hour - August 3, 2005 16:00

² Midwest ISO Peak Hour - July 31, 2006 16:00

³ Midwest ISO Peak Hour - August 8, 2007 16:00

⁴ Due to the limited amount and irregular distribution of data available, this methodology may not be used for future analyses or wind resource accreditation.

Wind Utilization



* - Capacity factor is calculated by dividing actual generation by the installed capacity

ERCOT & Midwest ISO Wind “Events”

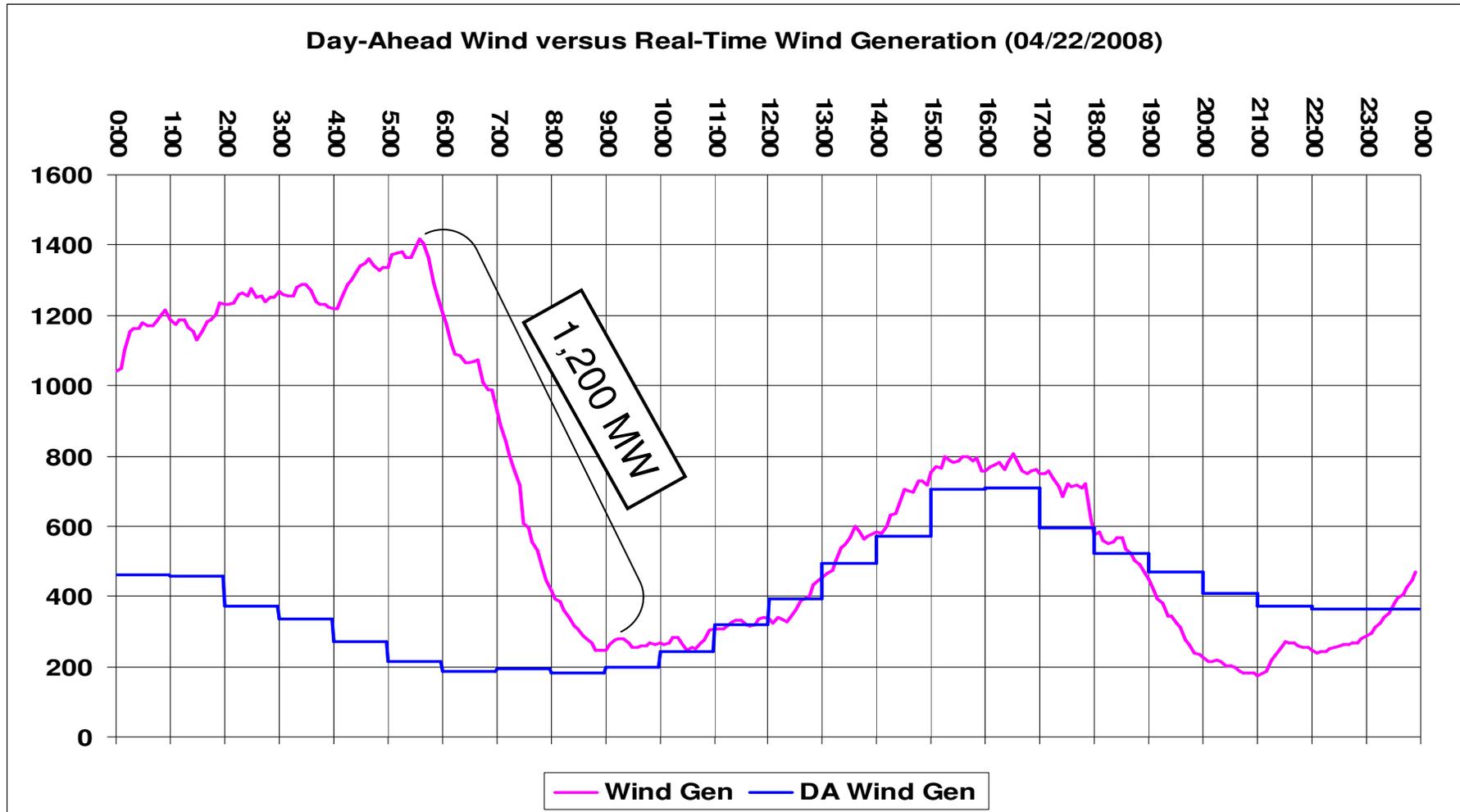
ERCOT (2/26 1840 –2140)

- Drop of 1,400 MW of wind generation (from 1,700 MW to 300 MW) over 3-hour period combined with evening ramp load increase and unexpected unit outages
- Drop in wind generation led to system constraints in moving generation from North Zone to load in West Zone
- ERCOT moved straight to 2nd stage of emergency procedures
- Loads Acting as Resource (LAAR) demand response program activated
 - Approximately 1,100 MW of resources received via LAAR program

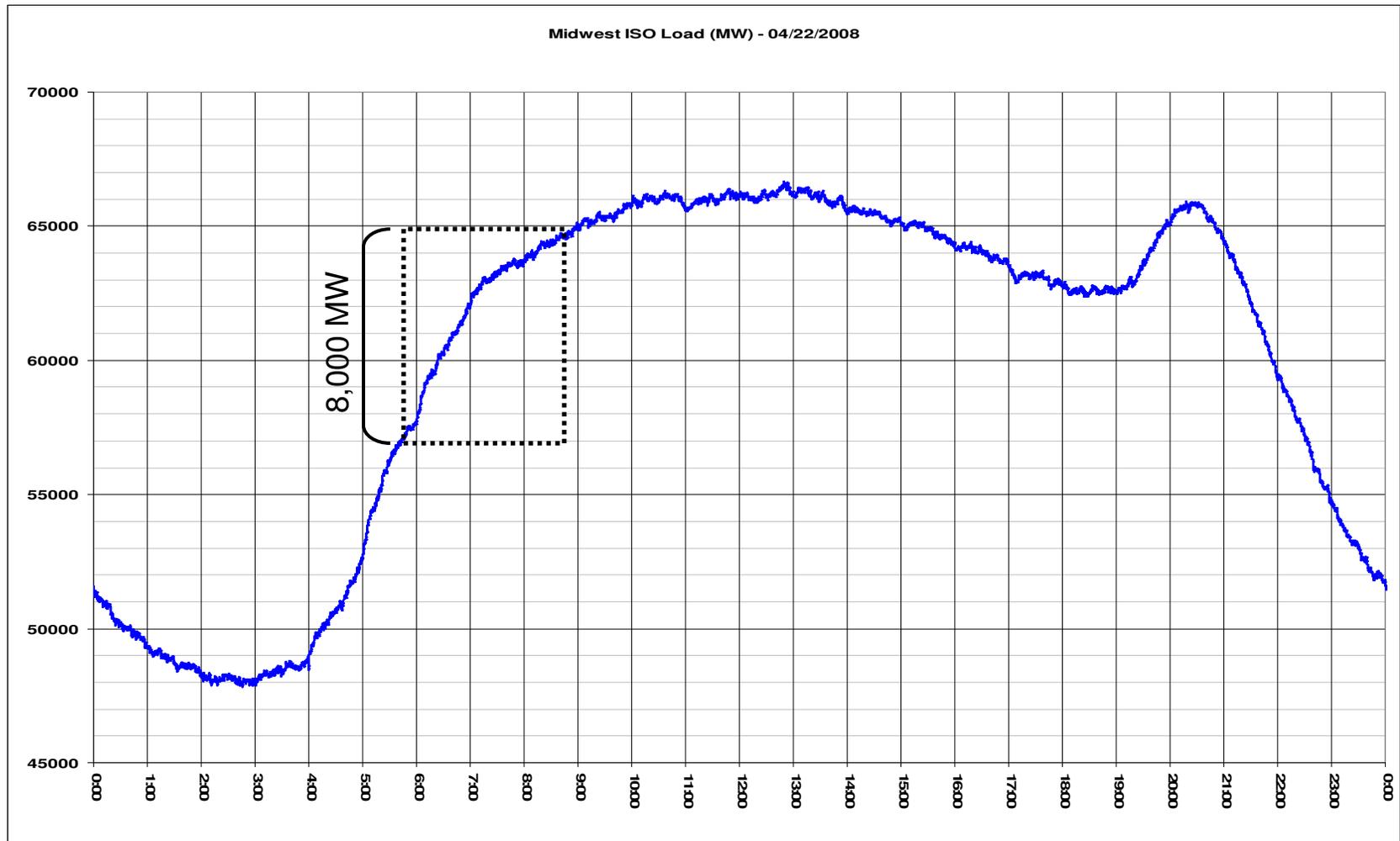
Midwest ISO (4/22 0540 – 0840)

- Drop of 1,200 MW of wind generation (1,450 MW to 250 MW) over 3-hour period combined with morning ramp load increase of approximately 8,000 MW
- Drop in wind generation led to no significant system constraints
- No emergency procedures were initiated
- No demand response programs were activated
- Midwest ISO experienced swings in Net Scheduled Interchange (NSI) during the day of as much as 5,800 MW – this is common operational reality on the Midwest ISO system and operators are used to managing

Midwest ISO Day-Ahead vs. Real-Time (4/22)



Midwest ISO Real-Time Load – 4/22



Resource Adequacy Status

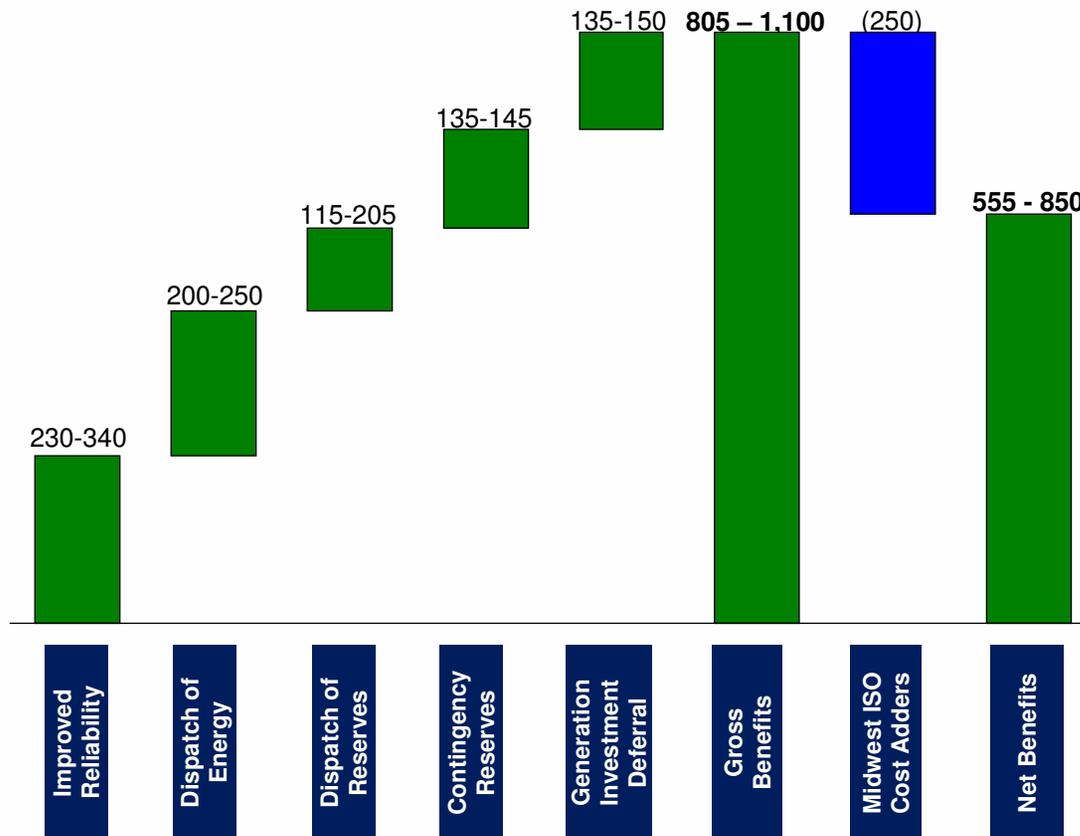
- Revised Module E filed December 28, 2007
- Approved by Commission March 26, 2008
- Approved tariff includes:
 - Reserve margin requirements
 - Load forecast requirements
 - Qualification criteria for both supply and demand side resources
 - Compliance assessment

Resource Adequacy Status (2)

- FERC filing required by June 25, 2008 to address financial settlement of “deficient” LSEs
 - OMS and stakeholder working groups have developed proposals based on assessment of monthly charge to LSEs that fail to procure sufficient resources to meet reserve margin requirements
 - OMS has voted to support charge to load with inadequate resources based on administratively determined price (intended to reflect cost of new entry)
 - Stakeholder working groups expect to vote by end of May
 - Financial settlement expected to be implemented for 2009-2010 planning year

Midwest ISO Value Proposition

Midwest ISO Annual Benefit by Value Driver¹
(in \$ millions)



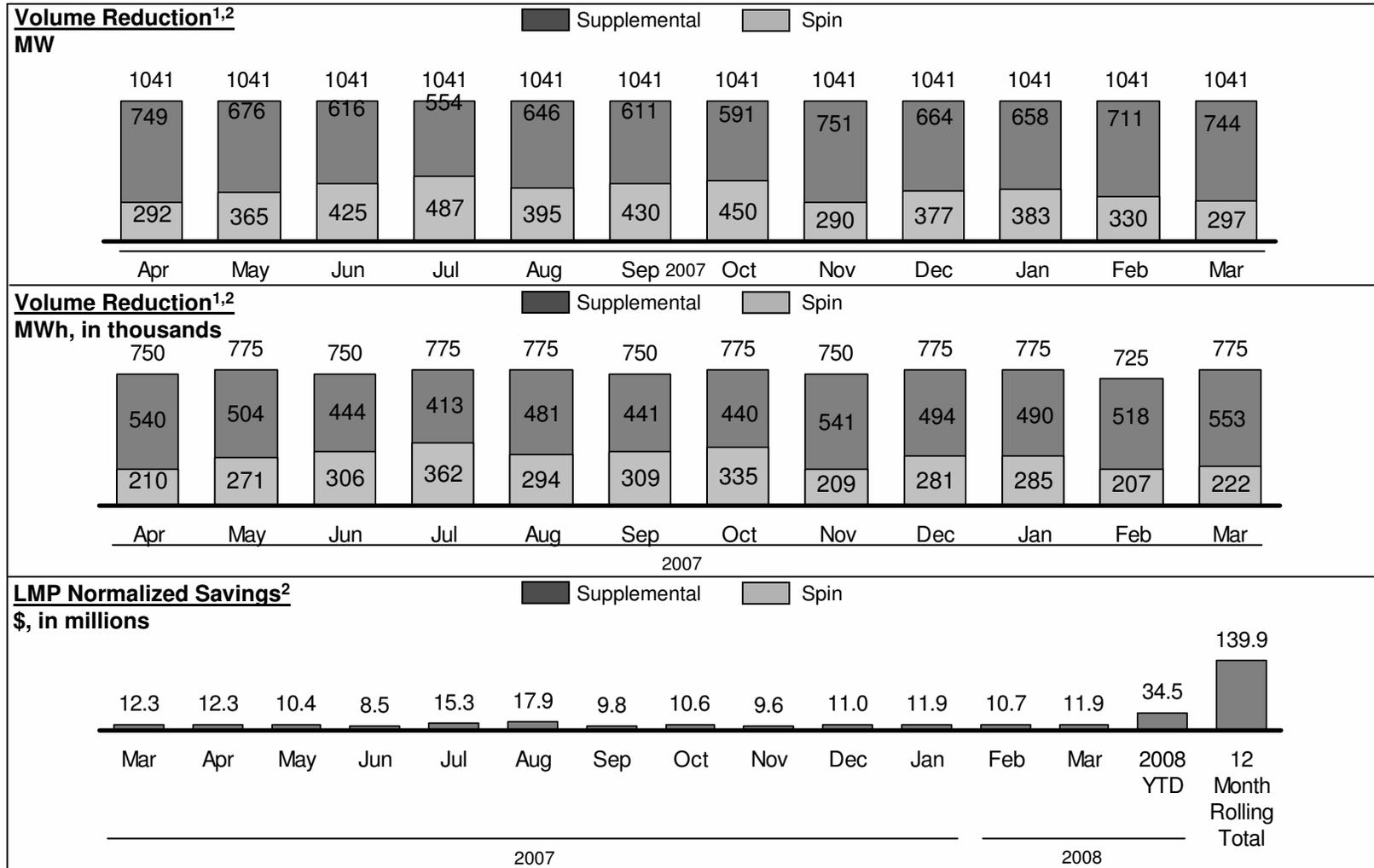
Qualitative Value Drivers

- Price Transparency
- Data / Informational Transparency
- Planning Coordination
- Seams Management
- Regulatory Compliance
- Wholesale Platform for Demand Response
- Wholesale Platform for Renewable Portfolio Standards



(1) Figures shown reflect annual benefits and costs reflected in 2007 dollars.

Contingency Reserve Sharing Group



1 - Data is self-scheduled and as supplied by Balancing Authorities, causing the variation in volumes from the Contingency Reserve Requirements
 2 - Reductions and savings calculated as the savings over the same month in 2006